Ayers '728 patent is substantially identical to the disclosure in the PCT publication. Though cumulative in light of the PCT publication WO 95/26294, the Ayers '728 patent is being submitted in a Supplemental Information Disclosure Statement.

Specifically, it is argued that Horton '467 discloses a SPAR but fails to disclose or fairly suggest a vertically oriented protective profile section rotatably mounted about the hull. It is suggested that the PCT publication discloses a SPAR platform having a shroud surrounding the hull and forming an outer perforated surface so as to be less susceptible to vortex-induced-vibration (VIV). The Examiner states that it would have been obvious to one of ordinary skill in the art to have added the shroud of the PCT publication to the hull of Horton '467 in order to provide less resistance to lateral forces resulting water current drag. Attorney notes that the PCT publication itself discusses the application of an outer shroud to a SPAR structure.

The Examiner then states that Horton '467, as modified by the PCT publication, fails to specifically disclose the fairing shaped profile section as the protective section. Jones '605 discloses a riser pipe having a vertically oriented fairing mounted on the riser pipe for free rotation about it; the fairing's factors affecting the efficiency of a streamlined form are the ratio of its thickness at its widest portion to its chord or length and the distribution of its thickness along the length of its chord. The range of the ratio is about 30% for the fairing body. It is argued that in view of Jones '605, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the protective profile section/shroud of Horton '467 as modified by the PCT publication "by replacing the fairing section to the floating hull in order to provide less resistance to enhance the vibration reducing functions of the shroud to the VIV."

Attorney agrees that Horton and the PCT publication both disclose a SPAR type structure, including a vertically oriented elongated floating hull having a buoyant upper section, a ballasted lower section and a truss member separating the upper and lower sections, and an anchoring section. Attorney would further concede that the shroud of the Ayers '728/PCT publication may be readily adapted to the SPAR structure of Horton '467. However, Attorney respectfully submits that it would not have been obvious to replace the shroud of the Ayers '728/PCT publication with the rotatable fairing of Jones '605.

First, the shroud disclosed in the PCT publication and Ayers '728 is not rotatably mounted, nor does it suggest a means or reason for doing so. Indeed, the shroud disclosed in the PCT publication and Ayers '728 patent is attached to the SPAR utilizing, preferably, standoffs which result in the shroud standing off 0.03 to 0.12 SPAR diameters from the SPAR surface. Col. 2, lines 50-60.

Second, the mechanism used to reduce VIV in the proposed Horton '467/Ayers '728 combination is different than that suggested in Jones '605. In the proposed Horton '467/Ayers '728 - PCT publication combination, the perforated shroud operates to break up the vortex shedding, reducing the force exerted

thereby and, consequently, the VIV forces acting upon the SPAR. In the specification of the Ayers' 728/PCT publication, a table is displayed setting forth the drag coefficient $C_d$ for various size perforations and porosity of the shroud body. It should be noted that the modeling thereof does not disclose a $C_d$ of less than 0.89. The mechanism employed by a shroud is similar to that of helical strakes – it breaks up the vortex.

The mechanism used to reduce vortex shedding and VIV in Jones '605 is to reduce the drag coefficient $C_d$ of the body through the use of a fairing. *See*, col. 3, line 66 – col. 4, line 31. Unlike Ayers '728/PCT publication, the streamlining delays the formation of a vortex until the very tip of the fairing, where much of the vortex formed does not act upon the body. This is similar to the vortex formed by an aircraft wing. Jones '605 contemplates a riser fairing system having a Reynolds number of up to 3 E6 and a $C_d$ of *not more than 0.1*. *See*, col. 4, lines 1-8. Not only is the mechanism different, the allowable drag coefficients for each structure are substantially different.

Attorney respectfully submits that, given the two differing mechanisms for dealing with VIV suppression disclosed in Ayers ' 728/PCT publication and Jones '605, one of ordinary skill in the art would not contemplate the combination of Horton '467/Ayers '728/Jones '605 posited by the Examiner. Indeed, given the differing $C_d$ requirements, the cited art would appear to teach away from the combination suggested by the Examiner.

As noted previously, Jones '605 does not teach or suggest a faired SPAR structure, having Reynolds numbers typically in the range of 5 – 50 E6. This is well in excess of that contemplated by the Jones '605 patent (3 E6). Conventional applications teach away from the use of fairing with a structure having this large a diameter and high a Reynolds number. Moreover, the chord to length ratios disclosed in the present invention, 1.5 to 1.2 for short fairings and 1.2 to 1.1 for ultrashort fairings, are not suggested by Jones '605. The chord/length ratio taught by Jones '605 is one the order of 30%, whereas the present invention teaches chord/length ratios on the order of 67% to 91%. As noted previously, this is well outside what is taught by Jones '605 and conventional thinking within the industry.

Attorney respectfully submits that the art itself teaches away from the combination of Ayers '728 - PCT publication and Jones '605, as well as the suggested combination of Horton '467/Ayers '728 – PCT publication/Jones '605. Furthermore, the combination of Horton '467 and Jones'605 at most teaches a SPAR with faired risers. The combination fails to disclose, teach or suggest the invention in claims 1, 2 and 6. Accordingly, claims 1, 2 and 6 are patentable over the cited art.

Rejection of Claims 4, 5, 7 and 8 Under 35 U.S.C. §103(a)

In Paragraph 5 of the Office Action, the Examiner rejects claims 4, 5, 7 and 8 under §103(a) as being unpatentable over Horton '467 as modified by Ayers '728 – PCT publication and Jones '605, and

further in view of Schuh '096. Attorney respectfully traverses the rejection. Schuh discloses a streamlined riser pipe having a high chord to length ratio that is incapable of rotating about a riser 13. As noted in the prior response, if Schuh fairing 22 were to be permitted to rotate in response to changes in current direction, the choke line 24 and hose bundle 26 would twist and could become damaged or fouled.

As noted above, the combination of Horton '467/Ayers '728 – PCT publication/Jones '605 fails to disclose, teach or suggest the invention of claims 1, 2 and 6. Accordingly, claims 4, 5, 7 and 8, which depend from claims 2 and 6 are likewise patentable over the cited art. The addition of Schuh '096 does nothing to overcome the inadequacies of the Horton/Ayers/Jones suggested combination. Accordingly, claims 4, 5, 7 and 8 are likewise patentable over the cited art.

## CONCLUSION

Attorney has addressed each and every ground for rejection cited in the Office Action. Accordingly, claims 1, 2, and 4-8 are now in a state ready for allowance. In the event the Examiner has any questions or any additional issues arise with respect to this application, the Examiner is invited to call the undersigned to address same prior to the issuance of any formal action.

Respectfully submitted,
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